Arid Zone Monitoring Species Profile

Greater bilby

Language names

Artnangke, Aherte, Angkaye, Mangkapan, Maruru, Mankarr, Mirtuluju, Nini, Ninu, Tjalku, Walpajirri, Warrikirti

National status: Vulnerable



IUCN Red List: Vulnerable

Animal Description

Bilbies are medium-sized desert mammals, related to bandicoots. Males are bigger than females. They are mostly active at night and spend the day in burrows.

Key threats

- Predation by cats and foxes
- Habitat change from too much grazing by feral herbivores (livestock, camels, rabbits and mice)
- Wrong-way fire (too often, too intense, too big)
- Climate change (changing rainfall, temperature, droughts)

Greater bilby

Bilby signs (diggings and burrows)

Bilbies often dig their burrows under logs, trees, grass, or termite mounds. Look for tracks around the entrance. Diggings can be of different shapes and sizes but are usually conical, and less than 50cm deep.



Image: Judy Dunlop

Bilby burrow. Note the tracks around the entrance.

Bilby tracks

The tracks from the back feet are narrower and longer than the tracks from the front feet. The track from the back legs is made mostly by the fourth toe.



Bilby tracks. The back legs land in front of the front legs (arrows show which way the bilby is going).



Bilby tracks (arrow shows which way the bilby is going).



Bilby scats are longer than wide. They are often found where bilbies are eating, not around burrows. They have bits of insects and sand in them.



Bilby diggings and scats.

Animals that might be confused with the bilby during a survey

• Mulgara • Rabbit

Rabbits have the same step as bilbies, but rabbits do not leave a distinct outline of their foot pads because they have fluffy feet. Rabbits also have different shaped hind feet, and their tracks are more rounded. Mulgara tracks are smaller than bilby tracks, and their back and front feet are the same size.

Habitat

Bilbies live in sandplains and areas of laterite with spinifex (*Triodia* spp.) grass, and they like a mixture of long unburnt spinifex and freshly burnt areas. Bilbies eat a range of seeds, small invertebrates, fruits and grasses, and managing fire well can make bilby foods more common. Bilbies need the right type of ground to make burrows. Where the soil is too soft, you will not find bilbies because their burrows



Insect larvae, e.g. witchetty grubs (Endoxyla leucomochla).

would collapse. Likewise, bilbies cannot live where the ground is too hard to dig. Even if the country provides the right soil, food, and cover, bilbies may not be able to live there if there are too many cats or foxes.

Fire management can make bilby foods more common. Favourite bilby foods include grubs, termites, some fruits, and grass seeds.



Wild bush tomato (Solanum centrale).



Termite mound.



Bush onion (Cyperus bulbosus).

Arid Zone Monitoring project findings

Bilby distribution

Bilbies used to occur across most of the desert country (the shaded bioregions on the map). Since European colonisation, they have disappeared from over three-quarters of their range (the cream-coloured bioregions) and are only found in northern parts of their original distribution (darker shaded bioregions). The information about the overall distribution in the map background is drawn from the Mammal Action Plan¹.

The maps show the bilby detections in the AZM dataset over time. Each blue dot shows a survey site where bilbies were recorded in that decade. The grey dots show all the other sites that were surveyed, but where bilbies were not recorded in that decade. These maps show that bilbies are mostly recorded in north-western parts of the deserts, apart from a smaller population in south-west Queensland. We can also see that track-based monitoring is detecting bilbies in areas where they became locally extinct, but have since been reintroduced, in western WA. These records were made by Indigenous Ranger groups, land councils, NGOs, government agencies and university researchers.



The maps above show data shared by data providers with the AZM project. The data are from track and sign surveys. This method is great for detecting species that live in sandy deserts, but not as good for species that prefer rocky habitats, or species with distributions that are mostly outside the central deserts. The method also works best for larger-bodied animals with tracks that are easily identified.

It is possible that extra surveys have been carried out that have not yet been shared. If you see 'gaps' in the maps that you could fill by sharing your data, let us know.

Bilby detection rates

Bilbies were detected at over 6% of all surveys in the AZM database. It was the sixteenth most commonly recorded species, and the sixth most commonly recorded native mammal. This is a relatively high detection rate, and reflects that many surveys are carried out to find out where bilbies are living.

The map below shows the average bilby detection rate across all surveys carried out in each bioregion, since the 1980s. The map shows that detection rates for bilbies have been highest in southeast Queensland (darkest blue shading). This is because most of the surveys there were targeting bilbies over other species, and sites where bilbies were present were revisited in later years.



Things to think about when surveying for bilbies

- Survey during good conditions (in the early morning is best, not too windy or straight after rain).
- Organise to do surveys at regular times every year – for example, before the wet or hot season (October) and in the early dry season or early cool time (April).
- Follow advice of experienced trackers know how to tell bilby tracks apart from other species such as rabbits and mulgara before you go to survey.
- Bilby signs are more likely in country that they like – for example where there are bilby foods, where the soil is good for digging and the spinifex is

long unburnt. Some country might have the right conditions, such as fire, foods and rain, but bilbies may not be there. It is still important to survey these places. You might learn that there are too many cats or foxes there, or wrong way fires.

 If you want to see changes over time, you will need to go back to the same areas to sample over several years. If you want to see if management actions (feral animal culling or fire) are working, you need to sample many different sites, before and after the action. You might need help from a scientist to make the sampling design strong.

Bilby habitat suitability

The habitat suitability model can tell us about where bilbies are most likely to be found. The analysis considered climate factors like annual, seasonal and daily temperature and rainfall; landform factors like elevation and slope; soil factors; and habitat factors like the amount of vegetation (NDVI) and fire frequency.

The model showed that bilbies are now mostly found in warm areas where average temperatures are usually above 24 degrees. The best country for bilbies is the brown and yellow coloured areas on the map - these places would be good to check, if surveys are targeting the bilby. The map only shows habitat suitability inside the AZM project boundary, but bilbies are also found further north and west, in the darker shaded part of the map, and might be common in these places too. The habitat suitability model does not predict well in large areas where there has not been any sampling, for example in parts of the Great Sandy Desert; getting more survey data from these areas would improve the model.



Further information

Arid Zone Monitoring project

https://www.nespthreatenedspecies.edu.au/projects/arid-zone-monitoring-surveys-for-vertebrates-across-arid-and-semi-arid-zones

References

¹ Woinarski, J.C.Z & Burbidge, A.A. & Harrison, P.L. (2014). The Action Plan for Australian Mammals 2012. (CSIRO Publishing: Melbourne.)



This project received support from the Australian Government's National Environmental Science Program.

The Arid Zone Monitoring project is a collaboration between the NESP TSR Hub and over 30 Indigenous ranger groups and Indigenous organisations, 8 NGOs and NRM groups, 5 government agencies institutions, and many individual researchers and consultants. The project has gathered track and sign data from across Australia's deserts, using it to map the distributions of desert species and their threats. The national database includes almost 50,000 species presence records from over 5300 unique sites and almost 15,000 site visits, over the period from 1982 to 2020. The project area was defined by using IBRA subregional boundaries - the project boundary captures Australia's desert subregions where track and sign-based surveys are commonly used. The project showcases the collective work carried out by all groups working across the arid zone, and lays the groundwork for creating ongoing, national-scale monitoring for desert wildlife. Cite this publication as NESP Threatened Species Recovery Hub, 2021. Arid Zone Monitoring Species Profile: Greater bilby, Project 3.2.5 findings factsheet.